

REMARKS

Favorable reconsideration and allowance of this application are requested.

1. *Discussion of Amendments*

By way of the amendment instructions above, several of the pending claims have been amended so as to address the informalities noted by the Examiner. In this regard, the definition of claim 38 for R⁴ and R⁵ has been revised so to emphasize that substitution is optional. A similar amendment has been made to claims 41 and 52. Support for the same is found in the original specification on page 7, lines 24 to 29.

Claims 40 and 47 has been canceled.

Claim 41 has been revised so as to delete the redundant expression "with the exception of (meth)acrylic acid". Claims 44 and 51 have been amended so as to insert "with film Y" for clarity purposes. In claim 53 "hydroxylamine" has been replaced by "triethanolamine", based on the disclosure in the specification of the present application on page 14, line 29.

Therefore, following entry of this amendment, claims 38-39, 41-46 and 48-53 will remain pending in the application, of which claims 38, 41, 45, 48, and 52 are in independent format. Favorable reconsideration and allowance of such claims are therefore solicited.

2. *Response to 35 USC §112 Issues*

The amendments and comments above are believed to address the Examiner's rejections advanced under 35 USC §112, second paragraph. Accordingly, withdrawal of such rejections is in order.

3. Response to 35 USC §103(a) Issues

3.1 Claim rejections of claims 52 and 53 separately over Denzinger et al. (US 5,175,361) and Kirk et al. (US 5,601,723)

3.1.1 Independent claim 52

In independent claim 52, a composition for treating metal surfaces is claimed comprising the following compounds

- a) at least one copolymer as component A,, said copolymer is synthesized from
- aa) 50 to 99.9% by weight of(meth)acrylic acid or salts thereof as component Aa;
- ab 1) 0.1 to 50% by weight of a carboxylate-containing monomer of the formula I, which may be maleic acid anhydride, as component Ab 1;
- ab2) optionally 0.1 to 50% by weight of monomers containing groups containing phosphoric and/or phosphonic acid or salts thereof, as component Ab2; and
- ac) 0 to 30% by weight of further comonomers, as component Ac.

The composition according to claim 52 further comprises the components B, optionally C, F as well as D, wherein

- B is water or another solvent which dissolves, disperses, suspends or emulsifies the copolymer (component A);
- C are surface-active additives, dispersants, suspension agents and/or emulsifiers;
- F is at least one acid or one alkali metal or alkaline earth metal salt of said acid selected from the group consisting of phosphoric acid, sulphuric acid, sulfonic acids, formic acid, acetic acid, nitric acid, hydrofluoric acid, and hydrochloric acid; and

D is at least one tertiary alkaline amine.

The composition according to claim 52 therefore comprises a copolymer as component A, water or another solvent as component B, at least one acid or one alkali metal or alkaline earth metal salt of said acid as component F, at least one tertiary alkaline amine as component D as well as optionally surface-active additives, dispersants, suspension agents, and/or emulsifiers as component C.

3.1.2 Denzinger et al.

In Denzinger et al a composition is disclosed which can be used as a scale inhibitor in a water system. The composition comprises a copolymer based on 10 to 60% by weight of monomers a) which are monoethylenically unsaturated monocarboxylic acids, their salts or their anhydrides, whereby maleic acid or maleic acid anhydride are preferred (column 2, lines 3 to 12 in combination with column 2, line 47), 40 to 90% by weight of monomers b) which are monoethylenically unsaturated monocarboxylic acids or their salts, whereby acrylic acid or methacrylic acid are particularly suitable (column 2, lines 13 to 16 in combination with column 2, lines 48, 49); and optionally up to 20% by weight of monomers c) which are free from carboxyl groups. Suitable examples of said monomers constituting the copolymer are vinylphosphonic acid or allylphosphonic acid as well as vinylsulfonic acid or allylsulfonic acid, whereby the sulfonic acid and phosphonic acid mentioned can also be employed in the form of their alkali metal salts and/or ammonium salts and/or amin salts (column 2, lines 33 to 44 in combination with column 2, line 50).

However, there is no disclosure in Denzinger et al that the aqueous compositions useful as scale inhibitors may comprise as a further *component* at least one acid or one alkali metal or alkaline earth metal salt of said acid selected from the group consisting of phosphoric acid, sulphuric acid, sulfonic acids, formic acid, acetic acid, nitric acid, hydrofluoric acid, and hydrochloric acid as well as at least one tertiary alkylene amine.

Even though acids like vinylsulfonic acid and allylsulfonic acid are mentioned in Denzinger et al and also alkali metal salts and/or ammonium salts and/or amine salts of the sulfonic acids and phosphonic acid mentioned as starting monomers c) in Denzinger et al, there is no disclosure at all in Denzinger et al that such acids, ammonium salts or amine salts are used as a component in an aqueous composition comprising a copolymer. It is very clear that the vinylsulfonic acid, allylsulfonic acid or ammonium salts and/or amine salts of sulfonic acids and phosphonic acids mentioned as starting monomers c) are employed as **monomers** for the preparation of the **copolymer** disclosed in Denzinger et al.

Claim 52 of the present application therefore differs from Denzinger et al in that the composition according to claim 52 comprises components F and D, which are **not comonomers**, in addition to the copolymer based on components Aa, Ab1, optionally Ab2 and optionally Ac. Thus, components F and D are present in the composition of claim 52 as components additional to the readily prepared copolymer.

3.1.3 Kirk et al.

In Kirk et al compositions to be used in a water circulating system are disclosed. Such compositions comprise a copolymer based on 3 to 50% by weight of monoethylenically unsaturated dicarboxylic acids, especially maleic anhydride (column 2, lines 16, 17 in combination with column 5, line 50); 50 to 97% by weight of monoethylenically unsaturated monocarboxylic acids, especially acrylic acid or methacrylic acid (column 2, lines 17, 18 in combination with column 5, lines 63, 64) as well as 0 to 40% by weight of carboxyl-free monomers, for example allylphosphonic acid, vinylphosphonic acid or allylsulfonic acid, methallylsulfonic acid, vinylsulfonic acid or N-vinylimidazol (column 6, lines 13 to 17 and column 6, line 21).

The composition of the present invention according to claim 52 differs from the composition in Kirk et al in the feature that the composition according to the present

invention comprises components F and D in addition to the copolymer and water. There is no disclosure in Kirk et al concerning a composition which comprises at least one acid or one alkali metal or alkaline earth metal salt of said acid selected from the group consisting of phosphoric acid, sulphuric acid, sulfonic acids, formic acid, acetic acid, nitric acid, hydrofluoric acid and hydrochloric acid as component F and at least one tertiary alkaline amine as component D *in addition to* a readily prepared copolymer based on components Aa, Ab1, optionally Ab2 and optionally Ac and water. The allylsulfonic acid as well as N-vinylimidazol mentioned by the Examiner are comonomers which may be present in the copolymer of Kirk et al. However, such monomeric components of Kirk et al do not exist as a part of a composition with the readily prepared copolymer.

3.1.4 Conclusions re Denzinger et al and Kirk et al

Neither Denzinger et al nor Kirk et al disclose or suggest a composition comprising all of the components present in the compositions according to claim 52 of the present invention. According to claim 52 of the present invention, a readily prepared copolymer comprising components Aa, Ab1, optionally Ab2, optionally Ac exists in addition to water *and in addition to* components F and D and optionally component C. The compositions defined by claim 52 are particularly useful for forming a passivating layer on a metal surface. However, the polymers according to Denzinger et al and Kirk et al are used as scale inhibitors and are added to an aqueous system. Therefore, the polymers according to Kirk et al and Denzinger et al are used as soil or scale entrainment systems. Components F and D are most certainly *not* useful in the systems according to Denzinger et al and Kirk et al. However, components D and F are very useful in the compositions according to the present invention, which are used for forming a passivating layer on a metal surface.

The systems of Denzinger et al. and Kirk et al, i.e., the provision of scale inhibitors, is therefore clearly different from the present invention, i.e., providing a composition for forming a passivating layer on a metal surface. As a consequence of this functional difference, the components of the compositions are also clearly different. There is no information in Denzinger et al and Kirk et al that the polymers mentioned therein may be useful for forming a passivating layer on a metal surface. As such, the compositions according to claims 52 and 53 are statutorily *nonobvious* over Denzinger et al and Kirk et al.

3.2 Rejection of claims 38-51 based on WO 00/55391

In WO 00/55391 a composition suitable for use in the treatment of metal surfaces is disclosed. The composition comprises silica, one or more organo-phosphonates or organo-phosphate species and/or one or more organo-phosphonates or organo-phosphate species, together with a carrier for the composition (claim 1). The organo-phosphonate or organo-phosphate species according to WO 00/55391 may comprise a polymer with pendant phosphonic or diphosphonic acid groups (page 3, lines 11, 12). According to page 3, lines 14 to 30 the polymer may be a homopolymer of a phosphonic acid or a salt or an ester of a phosphonic acid. Alternatively, the polymer may be a copolymer of a phosphonic acid together with a second comonomer. The second comonomer may be an unsaturated carboxylic acid such as acrylic acid, maleic acid or methacrylic acid. Alternatively, the second comonomer may for example be an unsaturated sulfonic acid.

It is therefore clear that the copolymer disclosed in WO 00/55391 is based on only two different monomers, i.e. a phosphonic acid, a salt or an ester thereof and an unsaturated carboxylic acid. However, in WO 00/55391 also terpolymers of an unsaturated phosphonate species and other suitable comonomers are mentioned (page 4, lines 1 to 3). However, the only suitable comonomers mentioned are sulfonic acid, an

unsaturated carboxylic acid or acryl amide. The only specific terpolymer mentioned is a terpolymer of VPA (vinylphosphonic acid), VSA (vinylsulfonic acid) and acrylic acid.

The copolymers used in the compositions according to the present invention are based on at least two monomers, i.e. (meth)acrylic acid or salts thereof as component Aa and a carboxylate containing monomer of formula (I) as component Ab1. Optionally the copolymers according to the present invention may be based on monomers containing groups containing phosphoric and/or phosphonic acid or salts thereof as component Ab2 and further comonomers as component Ac. Copolymers based on both, (meth)acrylic acid or salts thereof as well as a carboxylate-containing monomer of formula (I) are not disclosed in WO 00/55391. The copolymers used according to the present invention are therefore clearly different from the copolymers mentioned in WO 00/55391.

There is further no information in WO 00/55391 that copolymers based on completely different comonomers than the copolymers mentioned in WO 00/55391 may be useful for forming a passivating layer on a metal surface.

Pending claims 37 to 51 are therefore statutorily *unobvious* over WO 00/55391. In this regard, it must be emphasized that only very specific copolymers are mentioned in WO 00/55391 and that WO 00/55391 teaches the ordinarily skilled person of a difference between copolymers based on two different monomers and terpolymers based on three different monomers. This teaching is very clear from the specification on pages 3 and 4 in WO 00/55391. Since the polymers mentioned in WO 00/55391 are based on different monomers as compared to the polymers according to the present invention, a person of ordinary skill in the art would be provided with no information from WO 00/55391 that copolymers based on (meth)acrylic acid or salts thereof and a carboxylate-containing monomer of formula (I) may be useful for forming a passivating layer on a metal surface.

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Withdrawal of the rejection advanced against claims 38-51 based on WO 00/55391 is therefore in order also.

4. Fee Authorization

The Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Account No. 14-1140.

Respectfully submitted,

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